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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/082,264	05/20/1998	JIASHU CHEN	CHEN-1-(5442	2496

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EXAMINER

GRIER, LAURA A

ART UNIT PAPER NUMBER

2644

DATE MAILED: 07/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/082,264

Applicant(s)

CHEN, JIASHU

Examiner

Laura A Grier

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 177 is/are pending in the application.
- 4a) Of the above claim(s) 27-77 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8 is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-21, 23, 25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 9 (dependent claims 10-14), 15, 21, 23, and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding independent claims 9, 15, 21, 23, and 25, respectively, recites, “plurality of positions including multiple reflections, multiple sources without reflections, and multiple sources with multiple reflections”. It is unclear to the examiner whether or not the “multiple reflections” are inclusive in the “multiple sources with reflections”. In other words, it is unclear whether or not the sound signal composed of the plurality of sound source positions is composed of three components based upon reflections or composed of two components based upon reflections. Thus the claim language makes the claimed invention indefinite.

Regarding independent claims 23 and 25, respectively recites, “weighting said filtered sound signals, ..., and summing said filtered sound signals”. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1-7, 16-19** are rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al.

Regarding **claim 1**, Chen et al. discloses methods and apparatus for producing directional sound. Chen et al.'s disclosure comprises means of determining a characteristic function, wherein the characteristic constitutes a head-related impulse response and are determined based upon a plurality of positions in a space (col. 3, lines 58-62), means of applying the characteristic function as a filter, and means of converting the filtered signal to a sound wave thus providing/producing the sound wave to a listener (figure 5b, col. 6, lines 45-67 - col. 7, lines 1-5 and col. 8, lines 1-25), and as well, Chen disclose the use of a discrete number samples to be used and eigenvalues (col. 4, lines 8-57, and col. 5, lines 49-53).

Regarding **claim 2**, Chen et al. (herein, Chen) discloses everything claimed as applied above (see claim 1). Chen et al.'s disclosure further support for the characteristic function comprising data information related to the environment in which the sound is perceived (col. 3, lines 63-64).

Regarding **claims 3-7**, Chen discloses everything claimed as applied above (see claim 1). Chen et al.'s disclosure further inherently provides support of a spatial feature extraction and regularization model; spatial component and temporal component (summed matrix of a

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predetermined number of eigen vectors ranging from 3 to 16); and wherein the components are determined by a Karhunen-Loeve Expansion (col.4, lines 24-67 - col. 5, lines 1-53).

Regarding **claim 16**, Chen et al. discloses methods and apparatus for producing directional sound. Chen et al.'s disclosure comprises an environment input for receiving information of regarding the listening of the listener; means constituting a calculator with a computer program (col. 5, lines 58-65 and col. 7, lines 6-50); input for receiving a signal representing a sound which based upon a plurality of positions in a space (col. 3, lines 58-62); and left and right channel with a filter array for applying a filter to the signal, in which the function of the filter comprises a head-related impulse response; and an output for converting the filtered signals to the binaural sound and producing a sound to the listener (figure 5a and col. 6, lines 20-44 and col. 13, lines 2459) . Further Chen's disclosure comprises eigen filters and placement arrays (col. 4e, lines 8-21, col. 6, lines 20-44, and col. 7, lines 6-21 and figure 5a).

Regarding **claim 18**, Chen's disclosure comprises eigen filters (col. 4e, lines 8-21, col. 6, lines 20-44, and col. 7, lines 6-21 and figure 5a).

Regarding **claim 19**, Chen discloses everything claimed as applied above (see claim 16). Chen further discloses interaural time processing (col. 7, lines 6-21).

Regarding **claim 17**, Chen et al. discloses methods and apparatus for producing directional sound. Chen et al.'s disclosure comprises an environment input for receiving information of regarding the listening of the listener; means constituting a calculator with a computer program (col. 5, lines 58-65 and col. 7, lines 6-50); input for receiving a signal representing a sound which based upon a plurality of positions in a space (col. 3, lines 58-62); and left and right channel with a filter array for applying a filter to the signal, in which the

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function of the filter comprises a head-related impulse response; and an output for converting the filtered signals to the binaural sound and producing a sound to the listener (figure 5a and col. 6, lines 20-44 and col. 13, lines 2459). Further Chen's disclosure comprises eigen filters and placement arrays (col. 4e, lines 8-21, col. 6, lines 20-44, and col. 7, lines 6-21 and figure 5a), wherein the signal is filtered, and summed/added and output to the eigen filters for adequate temporal filtering (figure 5b and col. 6, lines 45-67 and col. 7, lines 1-21).

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. **Claims 9 and 11** are rejected under 35 U.S.C. 102(e) as being anticipated by Kamada et al., U. S. Patent No. 5995631.

Regarding claim 9, Kamada et al. (herein, Kamada) discloses sound image localization apparatus, thereof. Kamada's disclosure comprises a input means for receiving an a signal indicative of a sound originating at a plurality of positions in space, wherein the sound derive sounds with reflections and sounds without reflections, which is indicative of a plurality of positions including multiple reflections, multiple sources with reflections, and multiple sources with reflections (col. 38, lines 24-50, col. 39, lines 3-10 and figures 11-12 and 40); a left and right channel coupled with a filter array – direct filters (300/310), and reflection filters (302/312), which indicates a filter comprising a linear function including a head-related impulse response and loudspeakers for converting the filtered signals into binaural sound to the ears of an audience/listener (col. 39, lines 11-67 –col. 40, lines 1-21).

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Regarding claim 11, Kamada discloses everything claimed as applied above (see claim 9). Kamada further discloses delay means (301, 303, 311, 313) and attenuation via the reverse-phase signal producing means (col. 39, lines 12-65, and col. 44, lines 47-60).

6. Claim 10, 12-14 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

7. Claims 15, 21, 22, and 25 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

Response to Arguments

8. Applicant's arguments filed 04/30/04 have been fully considered but they are not persuasive.

Regarding claims 1-7, the applicant essentially argues that Chen fails to disclose head-related impulse response and contends that the examiner admitted it on page 7 of the Office Action. As stated in the last Office Action, it indicates that Chen discloses the limitation regarding the "head-related impulse response". Thus, rejection of claims 1-7 is maintained.

9. Applicant's arguments with respect to claims 9-25 have been considered but are moot in view of the new ground(s) of rejection.

The applicant argued against the prior art of Begault, and Chen and Sekine combined. The rejections of Begault, and Chen and Sekine have been removed. A new art rejection has been provided for claim 9 which supports a signal comprising sounds of reflections and sounds

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without reflections to indicate multiple sound sources with reflections and sound sources without reflections, therein.

In respect to the arguments against the 112 2nd rejection, the applicant's arguments fail to clarify the examiner's indefinite interpretation of the claim language, an explicit definition of the difference between positions of multiple reflections and multiple sources with multiple reflections. Thus, the rejection is maintained.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura A Grier whose telephone number is (703) 306-4819. The examiner can normally be reached on Monday - Friday, 7:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on (703) 305-4386.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

Or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

LAG
July 7, 2004

MINSUN OH HARVEY
PRIMARY EXAMINER